Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Review of Part 15 and other Parts of the	)	ET Docket No. 01-278
Commission's Rules	)	RM-9375
	)	RM-10051
	)	

THIRD REPORT AND ORDER

Adopted: April 15, 2004 **Released: April 23, 2004**

By the Commission: Chairman Powell issuing a statement.

I. INTRODUCTION

1. In this Third Report and Order, we are adopting regulations to allow for operation of improved radio frequency identification (RFID) systems in the 433.5-434.5 MHz ("433 MHz") band. Specifically, we are increasing the maximum permitted field strength and transmission duration for 433 MHz RFID systems used to identify the contents of commercial shipping containers in commercial and industrial areas to allow more rapid and reliable data transmission. Such improved RFID systems could benefit commercial shippers and have significant homeland security benefits by enabling the entire contents of shipping containers to be easily and immediately identified, and by allowing a determination of whether tampering with their contents has occurred during shipping.

II. BACKGROUND

2. RFID systems use radio signals to track and identify items such as shipping containers and merchandise in stores. A system typically consists of a tag mounted on the item to be identified, and a transmitter/receiver unit that interrogates the tag and receives identification data back from the tag. The tag may be a self-powered transmitter, or it may receive power from the interrogating transmitter and re-radiate an RF signal to the receiver. RFID systems can operate in a number of frequency bands under Part 15 of the rules, such as the 13.110-14.010 MHz (13.56 MHz) and 902-928 MHz bands.[1] RFID systems can also operate in the 40.66-40.70 MHz band and above 70 MHz.[2]

3. On October 15, 2001, the Commission adopted a *Notice of Proposed Rule Making and Order* in this proceeding that proposed a number of changes to Part 15 and other parts of the rules.[3] These proposals were based on recommendations contained within the *Biennial Regulatory Review 2000*

[1] *See* 47 C F R. §§ 15.225 and 15 249.

[2] *See* 47 C.F.R. § 15.231.

[3] *See Notice of Proposed Rule Making and Order* in ET Docket No. 01-278, ("*Notice*"), 16 FCC Rcd 18205 (2001).

Updated Staff Report,[4] staff recommendations, and two petitions for rule making concerning RFID systems.[5] The petitions for rule making were filed by the National Council for Information Technology Standardization Technical Committee B10 ("NCITS B10") and Savi Technology, Inc. (Savi).[6] The NCITS B10 petition requested rule changes for RFID systems operating in the 13.56 MHz band, and the Savi petition requested rule changes for RFID systems operating at 433 MHz.

4. On July 12, 2002, the Commission adopted a *First Report and Order* in this proceeding that required radar detectors to comply with the Part 15 emission limits for unintentional radiators with regard to emissions in the 11.7-12.2 GHz band to protect very small aperture satellite terminals (VSATs) from interference.[7] On June 25, 2003, the Commission adopted a *Second Report and Order and Memorandum Opinion and Order* ("*Second Report and Order*") that addressed many of the issues raised in the *Notice* that were not addressed in the *First Report and Order*, including RFID systems operating in the 13.56 MHz band.[8] In the *Second Report and Order*, the Commission stated that it would address rule changes for radio frequency identification systems in the 433 MHz band at a later date.[9]

III. DISCUSSION

5. Savi requests that the Commission modify the requirements in Section 15.231 of the rules for RFID systems operating at 433 MHz. This section allows the operation of intentional radiators, including RFID systems, in the 40.66-40.70 MHz band and at any frequency above 70 MHz, except in designated restricted bands.[10] There are two separate provisions for operation under this section. The first provision, in paragraph (a) of this rule section, contains operational requirements for devices that transmit control signals, such as those used with alarm systems, door openers and remote switches. A device operated under this paragraph must cease transmission within 5 seconds after being activated automatically or after a manually operated switch is released. Continuous transmissions such as voice and video are not permitted. Data is permitted to be transmitted with a control signal.[11] Periodic transmissions at regular predetermined intervals are not permitted except for transmissions of not more

[4] *See The 2000 Biennial Regulatory Review Report* and *Federal Communications Commission Biennial Regulatory Review 2000 Updated Staff Report* (*"Updated Staff Report"*), FCC 00-456, dated January 17, 2001.

[5] *See* National Council for Information Technology Standardization Technical Committee B10 (NCITS B10) petition for rule making filed September 4, 1998, RM-9375 and Savi Technology, Inc. (Savi) petition for rule making filed November 22, 2000, RM 10051.

[6] *See* NCITS B10 *Petition for Rule Making to Amend Section 15.225 of the Commission's Rules*, filed September 10, 1998, RM-9375 and Savi Technology, Inc. (Savi) petition for rule making filed November 22, 2000, RM-10051.

[7] *See First Report and Order* in ET Docket No. 01-278, 17 FCC Rcd 14063 (2002).

[8] *See Second Report and Order and Memorandum Opinion and Order* in ET Docket No. 01-278, 18 FCC Rcd 14741 (2003) (*"Second Report and Order"*).

[9] *See Second Report and Order* at 14742.

[10] *See* 47 C.F.R. § 15.231

[11] The previous prohibition on data transmissions under this section was removed in the *Second Report and Order* in this proceeding.

than two seconds per hour per transmitter to verify the integrity of security transmitters in a system.[12] The second provision, in Section 15.231(e), allows any type of transmission, including data and transmissions at regular periodic intervals. However, the field strength limits for devices operating under the provisions of paragraph (e) are lower than the field strength limits for devices operating under the provisions of paragraph (a). In addition, the provisions of paragraph (e) limit transmissions to no more than one second, with a silent period between transmissions of at least 30 times the duration of the transmission, but in no case less than 10 seconds. The field strength limits for intentional radiators operating under either provision in this section are based on the average value of the measured emissions. The peak level of emissions must comply with a limit of 20 dB (ten times) higher than emission limits specified in Section 15.231.[13]

6. RFID devices such as tags that send data not associated with a control signal are permitted to operate at 433 MHz under the provisions of Section 15.231(e) of the rules.[14] For devices operating at this frequency, the maximum permitted average field strength is 4,383 μV/m and the maximum permitted peak field strength is 43,833 μV/m, measured at a distance of 3 meters.[15] Devices operating under this section must comply with the timing requirements described above that limit transmissions to no more than one second.[16] Transmitters that send a control signal to interrogate RFID tags may operate at the higher field strength levels permitted for devices operating under Section 15.231(a), which are an average field strength of 11,000 μV/m and a peak field strength of 110,000 μV/m at 3 meters at a frequency of 433 MHz.[17]

7. Savi states that is has developed RFID tags for operation at 433 MHz because unlicensed operation is permitted at that frequency in many countries around the world, and because signals propagate better through objects at 433 MHz than at higher frequencies such as 900 MHz. Savi requests that the Commission increase the maximum field strength and transmission duration for 433 MHz RFID systems above the current limits in Section 15.231(e).[18] It states that a rule change to allow transmissions of longer duration is necessary because the current timing limit in Section 15.231(e) results in a slow transfer of data from the identification tag, and that transferring the full 128 kilobytes of data needed to identify all the contents of a shipping container could take up to 30 minutes under the current rules, but would take no more than two minutes with its proposed changes. Savi requests that the maximum transmission duration be increased to 120 seconds, while maintaining the current ten second minimum silent period between transmissions. In addition, it states that the maximum field strength limit under Section 15.231(e) is not sufficient to ensure reliable transmissions in all circumstances. It requests that the field strength limit for 433 MHz RFID tags be increased to the higher level permitted for control

[12] The rules previously limited periodic transmissions to a single transmission of not more than one second per hour. This rule was changed in the *Second Report and Order* to allow multiple transmissions not to exceed a total duration of two seconds per hour.

[13] *See* 47 C.F.R. §§ 15.231(b)(2) and 15.35(b)

[14] *See* 47 C.F.R. § 15 231(e).

[15] *Id.*

[16] *Id*

[17] *See* 47 C.F.R. § 15.231(b).

[18] *See* Savi petition for rule making dated November 22, 2000, RM-10051.

signals. Savi requests that the Commission implement the requested rule changes through one of three alternatives: 1) modifying Section 15.231, 2) adding a new section for RFID devices operating in the 420-450 MHz band that specifies higher field strength limits but no timing restrictions, or 3) adding a new section for RFID devices operating in the 425-435 MHz band with higher field strength limits and a 120 second transmission duration with a ten second silent period between transmissions. Savi asserts that these changes would enable use of improved RFID technology that would provide benefits including easier identification of the contents of shipping containers, the ability to detect tampering of shipping containers in transit and improved inventory control at commercial facilities.

8. In the *Notice,* the Commission proposed to create a new rule section for RFID systems operating in the 425-435 MHz band.[19] The proposed rule would allow RFID tags to transmit data at the higher level normally permitted for control signals, with an average field strength of 11,000 μV/m and a peak field strength of 1[illegible]0 μV/m measured at a distance of 3 meters. Out-of-band emissions would have to meet the current limit in Section 15.209. The Commission proposed to limit transmissions to 120 seconds with at least a 10 second silent period between transmissions, and to permit retransmissions in case of data errors. It also proposed to allow powered tags and readers to be approved either separately or under a single application, as proposed in the *Notice* for RFID devices operating in the 13.56 MHz band. These proposals were intended to allow greater range for 433 MHz RFID systems and to allow data to be transferred from an RFID tag more quickly.

9. Comments in favor of the proposal to increase the field strength limit and maximum transmission duration for 433 MHz RFID devices were received from Interlogix, Mattel, Savi, and VYTEK Solutions, Inc. (VYTEK).[20] Interlogix states that the 433 MHz band is widely used in Europe and other Region countries for radio control and short-range operations, and that the Commission should consider raising the power level in this band to harmonize with the ITU regulations.[21] It believes that the considerable savings to manufacturers in producing one model of device for sale in both the United States and Europe would enhance manufacturers' ability to better compete in world markets.[22] VYTEK states that increasing the permitted RFID device transmission time would increase the utility of such devices by allowing them to transmit greater amounts of data. VYTEK states that this would increase the efficiency and speed in handling materials and has the potential for increasing throughput at United States ports without the need for costly expansions.[23] Savi states that authorization of advanced RFID products would provide public benefits, including greater transfer of data, new and more robust services, lower costs, and increased homeland security.[24] It states that its system operates with low power and that operations will be restricted to commercial/industrial environments that severely restrict propagation.[25]

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[19] *See Notice* at 18214.

[20] *See* Interlogix comments at 6, Mattel comments at 2, Savi comments at 3-5 and VYTEK comments at 1-2.

[21] *See* Interlogix comments at 6.

[22] *See* Interlogix comments at 6

[23] *See* VYTEK comments at 1-2.

[24] *See* Savi comments at 3-5.

[25] *See* Savi comments at 6-8.

10. A number of parties object to the proposed rule changes for RFID systems in the 425-435 MHz band, stating that such changes would result in interference to remote control door openers, although no parties provided an interference analysis.[26] Operator Specialty Company, Inc. (OSCO) states that the proposed changes would allow new devices of unproven reliability to overpower the signals of millions of existing door and gate openers and render them unreliable.[27] Genie states that the Savi devices would transmit virtually a continuous signal that could reduce the effective range of remote control transmitters, and they would most likely be used outside commercial areas, making homeowners' remote controls inoperative for two minutes without an identifiable cause.[28] Chamberlain believes that 433 MHz RFID devices would interrupt commercial and residential use of access devices such as door and entry control systems and would create interference on a scale far beyond that typically introduced by new Part 15 devices.[29]

11. ARRL alleges that operation of unlicensed RFID devices at 433 MHz will cause substantial interference to licensed amateur radio operations in the 425-435 MHz amateur band, which it states is heavily used for terrestrial weak-signal communications in most parts of the country.[30] It alleges that interference could occur to amateur operations even beyond 1000 meters from an RFID system.[31] ARRL believes that RFID systems would be used outside commercial areas, so that geographic separation could not be relied upon for interference mitigation.[32] It claims that Savi could manufacture equipment to operate in the 900 MHz or 2.4 GHz ISM bands for the data throughput it needs, and that the only basis for the use of 433 MHz is to reduce hardware costs because cheaper components are readily available for that frequency.[33] ARRL does not believe that global standardization of RFIDs can be achieved at 433 MHz because of varying frequency allocations between countries.[34] It further claims that the Commission lacks authority under the Communications Act to authorize devices with a substantial potential for interference on an unlicensed basis.[35] It states that the rationale for allowing unlicensed devices under Part 15 is based on the assumption that such devices will not, in general, interfere with licensed radio services, and that Section 302 of the Act, which gives the Commission authority to regulate unlicensed devices, does not constitute an exception to the license requirement in Section 301.[36]

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[26] *See* OSCO comments at 1, Genie comments at 1, Chamberlain comments at 3 and Ademco comments at 3. Remote control door openers may operate on any frequency above 70 MHz except in certain designated restricted bands. They may operate anywhere within the 425-435 MHz band. *See* 47 C.F.R. §§ 15.205 and 15.231.

[27] *See* OSCO comments at 1.

[28] *See* Genie comments at 1.

[29] *See* Chamberlain comments at 4-7.

[30] *See* ARRL comments at 11.

[31] *See* ARRL comments at 12.

[32] *See* ARRL comments at 13.

[33] *See* ARRL comments at 15-16.

[34] *See* ARRL comments at 17.

[35] *See* ARRL comments at 4.

[36] *See* ARRL comments at 7.

A large number of comments were also received from individual amateur operators and groups of amateurs expressing concerns similar to those of ARRL.

12. The National Telecommunications and Information Administration (NTIA) initially opposed the rule changes proposed in the *Notice* for 433 MHz RFID devices. It stated that the 425-435 MHz band is within the 420-450 MHz band that is allocated to the Federal Government on a primary basis, and that this band contains ground-based, shipborne and airborne radars that are essential for the nation's homeland defense.[37] NTIA claims that RFID devices operating under the proposed parameters would cause interference to federal radar operations in the 425-435 MHz band.[38] In response to the interference concerns raised by NTIA, Savi states that a number of adjustments could be made to the proposed operational requirements that would alleviate NTIA's interference concerns yet still allow for improved RFID operation at 433 MHz. Specifically, Savi states that the following adjustments could be made:[39]

1) Narrow the permissible frequency band of operation from 425-435 MHz to 433-435 MHz
2) Lower the peak field strength limit from 110,000 μV/m to 55,000 μV/m at 3 meters
3) Reduce the maximum transmission duration from 120 seconds to 60 seconds
4) Adopt a narrower definition of RFID systems, including adding a prohibition on voice transmissions
5) Restrict operation of RFID systems at 433 MHz to commercial or industrial areas

13. After further study, NTIA concluded that RFID systems could be operated at 433 MHz without interference to Federal Government radar systems if the frequency band were further narrowed, the conditions proposed by Savi were met and certain additional conditions were met.[40] These modified and additional conditions are:

1) Narrow the permissible frequency band of operation to 433.5-434.5 MHz
2) Prohibit operation within 40 kilometers of the five Federal Government radar sites listed in Appendix A.
3) Register the locations where 433 MHz RFID systems operate

14. Based on the record in this proceeding, we find that the public interest would be served by allowing operation of improved 433 MHz RFID systems. Accordingly, we are adopting the proposal to increase the maximum field strength and transmission duration for RFID systems operating at 433 MHz, subject to the requirements that NTIA states are necessary to prevent interference to Federal Government radar systems. These changes will allow the development of RFID systems with greater range and faster, more reliable data transmission. Such RFID systems could enable the entire contents of shipping containers to be easily and immediately identified, and could interface with sensors that indicate whether tampering with a container had occurred in shipment. These capabilities could help increase homeland security and improve inventory control.

[37] *See* letter from NTIA to the Chief, Office of Engineering and Technology dated March 14, 2002.

[38] *See* letter from NTIA to the Chief, Office of Engineering and Technology dated October 15, 2002 at 4.

[39] *See* Savi *ex-parte* filings dated October 28, 2002 and October 15, 2003.

[40] *See* letters from NTIA to the Chief, Office of Engineering and Technology dated March 18, 2004 and March 24, 2004.

15. We are implementing these changes by adding a new rule section specifically for RFID systems operating in the band 433.5-434.5 MHz that contains the technical and operational requirements for these devices. The field strength limits will be 11,000 μV/m average and 55,000 μV/m peak, measured at a distance of 3 meters. The maximum permitted transmission duration will be 60 seconds rather than 120 seconds as proposed in the *Notice*, with a ten second silent period between transmissions. While this change will result in somewhat slower data transmission speeds in cases where all the data in a device can not be transmitted within 60 seconds, it represents a substantial improvement in speed over that which the current rules allow. In recognition of the fact that data transmission errors may occasionally occur, re-transmission of data will be permitted in case of transmission error without the need for a ten second silent period. As proposed in the *Notice*, we are adopting the current out-of-band emission limits in Section 15.209 for 433 MHz RFID devices because these limits have a long and successful history of controlling interference.

16. We recognize that the interference concerns raised with respect to 433 MHz RFID systems can be largely ameliorated by restricting the locations where they operate and the types of uses permitted. Such restrictions will limit the use of 433 MHz RFID systems to locations where they will not operate in close proximity to other users on the same frequency. Accordingly, we are restricting operation under the new RFID rule to the identification of the contents of commercial shipping containers. Voice communications will not be permitted. Further, we will require that operations be limited to commercial and industrial areas such as ports, rail terminals and warehouses. These requirements are essentially consistent with the conditions that Savi proposed and with which NTIA agreed that limit the types of devices and their operating locations to RFID systems used in commercial and industrial areas.[41] We do not believe that these restrictions will inhibit the development of this technology for important homeland security applications. We are permitting two-way operation by 433 MHz RFID devices as currently allowed for remote control devices.[42] Two-way operation will make RFID devices more useful by allowing a single device to both read data from, and write data to, remote devices. For example, an interrogator that reads data from a tag in a shipping container could also be used to update the data stored in the tag when items are added to or removed from the container. As proposed in the *Notice* and consistent with our actions in the *Second Report and Order* for 13.56 MHz RFID tags, we will allow 433 MHz RFID tags to be approved either as part of a system with a tag reader under one FCC identification number, or under separate FCC identification numbers. Allowing powered tags and readers to be approved together will simplify the filing requirements in cases where the devices are always sold together, and permitting tags and readers to be approved separately will provide increased flexibility to manufacturers by permitting the sale of different combinations of tags and readers.

17. In the *Notice,* the Commission proposed to require that 433 MHz RFID devices be self-contained with no external or readily accessible controls that may be adjusted to cause operation out of compliance with the rules, and proposed to require that devices have permanently attached antennas that

[41] *See* Savi *ex-parte* filing dated October 28, 2002 at 3. Savi notes that their devices are intended to be used on commercial shipping containers. *Id.* at 1.

[42] Remote control devices are operated under the provisions of Section 15.231 of the rules. This section allows periodic operation of devices in the 40.66-40.70 MHz band and any frequency above 70 MHz except for the restricted bands of operation specified in Section 15.205. *See* 47 C.F.R. §§ 15.205 and 15.231. Examples of remote control devices include garage door openers, keychain transmitters for locking and unlocking car doors and tire pressure monitors. RFID systems may be operated under the provisions of Section 15.231. This section allows either one-way or two-way operation by devices.

are not readily modifiable by the user.[43] Upon further consideration, we find that it is not necessary to specify these requirements in the final rules. Section 15.15(b) already prohibits readily accessible controls that can cause a device to operate in violation of the rules.[44] Further, Section 15.203 specifies that intentional radiators must have either a permanently attached antenna or other means to prevent a user from installing an antenna that causes a device to operate in violation of the rules. Because the existing rules provide adequate safeguards against these types of changes, the proposed requirements concerning external adjustments and antenna substitutions are not necessary.

18. NTIA requests that operation of 433 MHz RFID systems be prohibited for a distance of 40 kilometers around five Federal Government radar sites to prevent harmful interference to radar operations. NTIA supplied a list of these locations and their geographic coordinates that is shown in Appendix A. None of the five sites are within 40 kilometers of large metropolitan areas. Such a prohibition will still allow 433 MHz RFID tags to be used in the vast majority of commercial and industrial areas in the United States. In light of the need to protect government radar operations from interference, we are prohibiting 433 MHz RFID operation within 40 kilometers of these five radar sites. The coordinates of these sites are specified in Appendix A.

19. NTIA also requests that the operating locations of 433 MHz RFID systems be registered to assist in locating the source of any interference to Federal Government operations that may arise. While we generally do not require users of unlicensed devices to register their location, we have required users of certain ultra-wideband (UWB) transmitters to do so to protect Federal Government operations from interference. Specifically, we require users of UWB imaging systems to supply operational details to the Commission's Office of Engineering and Technology, which submits this information to NTIA.[45]

20. Consistent with NTIA's letter stating the need to protect critical government radar operations from interference, we are requiring grantees to register the locations of users of 433 MHz RFID systems with the Commission.[46] Registration of 433 MHz RFID systems is not a coordination, pre-approval, or licensing process, and it is not intended to give unlicensed devices protection from interference from other unlicensed devices. Rather, registration will allow the Commission and NTIA to monitor the deployment of 433 MHz RFID systems and help pinpoint the source of interference to government operations in case such interference occurs. The information that the grantee must supply to the Commission in registering the devices shall include the name, address, telephone number and e-mail address of the user, the address and geographic coordinates of the operating location, and the FCC identification number of the device. The user will be responsible for submitting updated information in the event the operating location or other information changes after the initial registration. The registration information must be submitted to the Commission's Office of Engineering and Technology at the address provided in Appendix A. The Commission will provide this information to NTIA. As a condition of the grant, we will require the grantee of an equipment authorization for a 433 MHz RFID device to inform purchasers of the locations where the devices may and may not be used, *i.e.*, that they may be used only in commercial and industrial areas, and that they may not be used within 40 kilometers of the five Federal Government radar sites specified in the rules. We are also requiring grantees to notify

[43] *See Notice* at Appendix A, proposed Section 15.240(d).

[44] *See* 47 C.F.R. § 15.15(b).

[45] *See* 47 C.F.R. § 15.525(b).

[46] *See* letter from NTIA to the Chief, Office of Engineering and Technology dated March 24, 2004.

users of their responsibility to register any changes in the operating location of devices or other registration information with the Commission.

21. Requiring grantees to register the locations of 433 MHz RFID system users as NTIA requests raises confidentiality issues for grantees. Savi states that a list of users and locations where equipment is used would likely be company sensitive information and that access should be restricted by password protection or otherwise limited to personnel at NTIA, the Department of Defense (DoD) or the Commission.[47] We recognize Savi's concern that such a list would be commercial and/or financial information that a manufacturer would want to remain confidential because it would be the manufacturer's customer list and could indicate approximately how many units of a device have been sold. Consistent with statute, the Commission does not make certain information available for public inspection, including trade secrets and commercial and financial information that are privileged and confidential.[48] The rules explicitly list certain types of materials in the category of trade secrets and commercial and financial information that are automatically afforded certain degrees of protection from public inspection.[49] If material in this category is not explicitly listed as being protected from public inspection, the party submitting the material to the Commission must accompany it with a request for non-disclosure if it wants the material to remain confidential.[50]

22. Because 433 MHz RFID registration information does not fall into a category that is explicitly listed as being protected from public inspection, the party supplying registration information would have to submit a request for confidentiality each time it files with the Commission, and the Commission would have to act upon each individual request. We expect that grantees would routinely request confidentiality for registration information filed with the Commission because they would consider this to be commercial and financial information that they do not want made available for public inspection. Each of these requests would be essentially identical and we expect that the Commission would grant them because the required registration information would fall into a category of information that the rules allow to be held confidential. Rather than process individual confidentiality requests each time a grantee registers a user's location or submits updated information, we find that it would be more efficient to adopt a change to Section 0.457(d) of the rules to state that 433 MHz RFID registration information is not routinely available for public inspection. This action would save Commission resources that would be used for processing numerous confidentiality requests and would be less burdensome on grantees because grantees will not have to file a request for confidentiality each time new or updated registration information is submitted to the Commission. Therefore, we are adding 433 MHz RFID registration information to the list of materials that are automatically afforded protection from public inspection. We will, however, make this information available to NTIA, DoD or other Federal Government entities with a need for it.

23. We have made a number of adjustments from our proposal that will eliminate any significant risk of interference to garage door controls. First, as noted above, we have restricted installation to use at only commercial and industrial areas for the express purpose of identifying the contents of shipping containers. Therefore, we do not anticipate widespread deployment in close

[47] *See* Savi *ex parte* filing dated December 4, 2003.

[48] *See* 5 U.S.C. § 552(b) and 47 C.F.R. § 0.457(d).

[49] *See* 47 C.F.R § 0.457(d)(1).

[50] *See* 47 C.F R. § 0.457(d)(2).

proximity to door opener controls. Further, we have narrowed the frequency range for RFID systems from the proposed 10 MHz to 1 MHz. We note that garage door controls can operate anywhere in the 425-435 MHz band where we originally proposed operation for RFIDs, thus reducing the likelihood of interference to such controls.[51] In addition, we have reduced both the peak signal level and the maximum permitted transmission duration for 433 MHz RFID systems by a factor of two from the proposed levels, further reducing the likelihood of interference. We find the arguments that 433 MHz RFID systems would cause interference unpersuasive in any event because the signal levels proposed in the *Notice* are no greater than the rules permit for garage door controls.[52] Further, users of unlicensed devices have no protection from interference from other devices and no vested right to the continued use of any frequency by virtue of prior certification of equipment.[53] Because operation of 433 MHz RFID systems will be limited to commercial and industrial areas such as ports, rail yards and warehouses, there will generally be substantial geographic separation between 433 MHz RFID devices and most other devices such as residential garage door openers that could receive interference. Door opener controls used in close proximity to 433 MHz RFID devices would most likely be under the control of the party operating the RFID devices, who could take appropriate steps in the event interference occurs, including changing the frequency of a door opener control, if possible, or ceasing operation a device that causes interference.

24. We observe that any potential interference to amateur operations is mitigated for the same reasons discussed above for door opener controls. ARRL expressed concern that the 425-435 MHz band originally proposed for RFID systems encompasses several bands that it has designated for weak signal use in its band plan.[54] However, the rules we are adopting limit 433 MHz RFID systems to the 433.5-434.5 MHz band. This band is separated by 500 kHz from the nearest weak signal band listed in ARRL's band plan, thus addressing ARRL's concern about RFID operation in weak signal bands.[55]

25. The 433.5-434.5 MHz RFID band we are adopting falls within the 433-435 MHz band that ARRL has designated for auxiliary and repeater links. Auxiliary stations are required by the Commission's rules to operate on a point-to-point basis and are permitted to operate with a maximum power of 50 watts.[56] Because point-to-point operations typically use directional antennas, there is less likelihood of interference from other sources. The rules we are adopting for 433 MHz RFID systems reduce the peak transmit level by a factor of 6 dB (two times) from the proposal, to a level 47 dB (55,000 times) lower than the level permitted for amateur auxiliary stations, further reducing the likelihood of interference. Additionally, the rules we are adopting limit operation to commercial and industrial area such as ports and rail yards, so operation will not be permitted in residential areas and on delivery trucks as many parties expressed concern. While there are other bands besides 433 MHz where RFID systems

[51] Door opener controls are permitted to operate on any frequency above 70 MHz, except for certain designated restricted bands. *See* 47 C.F.R. §§ 15.205 and 15.231.

[52] *See Notice* at 18214.

[53] *See* 47 C.F.R. § 15.5.

[54] *See* ARRL comments at 11. ARRL has developed a voluntary plan for use of the 420-450 MHz band by amateur radio operators that specifies different uses for different segments of the band. ARRL supplied a copy of their band plan for the 420-435 MHz band in Appendix A of their comments. This division of the band is not required by the Commission's rules.

[55] *See* ARRL comments at Appendix A.

[56] *See* 47 C.F.R. § 97.3(a)(7).

could operate, such as the 902-928 MHz and 2400-2483.5 MHz bands, we recognize that there are advantages to allowing operation in the 433 MHz band. Signals at lower frequencies, *i.e.*, 433 MHz, are attenuated less passing through objects, thus allowing more reliable operation. Further, although the 433 MHz band may not be available for use by unlicensed devices worldwide with the same technical parameters we are adopting for RFID systems, operation in the 433.05-434.79 MHz band is permitted in Europe, potentially allowing the development of RFID systems that are capable of operating in multiple countries.

26. We disagree with ARRL that the Commission lacks authority under Section 301 of the Communications Act to authorize 433 MHz RFID devices to operate at the power levels adopted herein on an unlicensed basis because they will pose a significant potential for interference to licensed services. ARRL advanced a similar argument in a proceeding concerning certification of transmitters in the 24.05-24.25 GHz band.[57] The Commission stated in that proceeding that it need not reach this statutory argument when it finds no significant interference potential.[58] It also noted that ARRL concurs that it is appropriate for the Commission to make reasonable regulations regarding Part 15 devices pursuant to Section 302(a) of the Act. Because we find that the rules we are adopting for 433 MHz RFID systems will not result in an interference risk to amateur services, we reject ARRL's argument in this proceeding that the Commission lacks legal authority to adopt such rules.

IV. PROCEDURAL MATTERS

27. Final Regulatory Flexibility Analysis. The Final Regulatory Flexibility Analysis for this Third Report and Order, pursuant to the Regulatory Flexibility Act, *see* 5 U.S.C. § 604, is contained in Appendix C.

28. This Third Report and Order contains new or modified information collections subject to the Paperwork Reduction Act of 1995 (PRA), Public Law 104-13. It will be submitted to the Office of Management and Budget (OMB) for review under Section 3507(d) of the PRA. OMB, the general public, and other Federal agencies are invited to comment on the new or modified information collection(s) contained in this proceeding.

29. To make cited sources more easily available to the readers, we are testing the use of hyperlinks to some FCC documents that are cited in this document. The World Wide Web addresses/URLs that we give here were correct at the time this document was prepared but may change over time. We do not have staff dedicated to updating these URLs, however, so readers may find some URLs to be out of date as time progresses. We also advise that the only definitive text of FCC documents is the one that is published in the FCC Record. In case of discrepancy between the electronic documents cited here and the FCC Record, the version in the FCC Record is definitive.

30. For further information regarding this Second Report and Order and Memorandum Opinion and Order, contact Mr. Hugh L. Van Tuyl, Office of Engineering and Technology, (202) 418-7506, e-mail Hugh.VanTuyl@fcc.gov.

[57] *See Memorandum Opinion and Order* in ET Docket No. 98-156, 18 FCC Rcd 15,944 (2003).

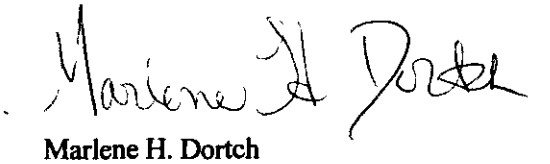
[58] *Id* at 15,947

V. ORDERING CLAUSES

31. Accordingly, IT IS ORDERED that pursuant to the authority contained in Sections 4(i), 301, 302, 303(e), 303(f) and 303(r) of the Communications Act of 1934, as amended, 47 USC Sections 154(i), 301, 302, 303(e), 303(f) and 303(r), this Third Report and Order IS ADOPTED and Part 15 of the Commission's Rules IS AMENDED as set forth in Appendix A effective 30 days after publication in the Federal Register.

32. IT IS FURTHER ORDERED that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this Second Report and Order and Memorandum Opinion and Order, including the Final Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

FEDERAL COMMUNICATIONS COMMISSION



Marlene H. Dortch
Secretary

APPENDIX A: FINAL RULE CHANGES

Part 0 of Title 47 the Code of Federal Regulations is amended as follows:

1. The authority citation for Part 0 continues to read as follows:

   AUTHORITY: Secs. 5, 48 Stat. 1068, as amended; 47 U.S.C. 155.

2. Section 0.457 is amended by adding a new paragraph (d)(1)(vii)

§ 0.457 Records not routinely available for public inspection.

* * * * *
(d) * * *
(1) * * *
(vii) Information on the users and locations of radio frequency identification systems submitted to the Commission pursuant to § 15.240 will be made available to other Federal Government agencies but will not otherwise be made available for inspection.

Part 15 of Title 47 of the Code of Federal Regulations is amended as follows:

3. The authority citation for Part 15 continues to read as follows:

   AUTHORITY: 47 U.S.C. 154, 302, 303, 304, 307 and 544A.

4. A new section 15.240 is added to read as follows.

§ 15.240 Operation in the band 433.5-434.5 MHz.

(a) Operation under the provisions of this section is restricted to devices that use radio frequency energy to identify the contents of commercial shipping containers. Operations must be limited to commercial and industrial areas such as ports, rail terminals and warehouses. Two-way operation is permitted to interrogate and to load data into devices. Devices operated pursuant to the provisions of this section shall not be used for voice communications.

(b) The field strength of any emissions radiated within the specified frequency band shall not exceed 11,000 microvolts per meter measured at a distance of 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The peak level of any emissions within the specified frequency band shall not exceed 55,000 microvolts per meter measured at a distance of 3 meters. Additionally, devices authorized under these provisions shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than 60 seconds and be only permitted to reinitiate an interrogation in the case of a transmission error. Absent such a transmission error, the silent period between transmissions shall not be less than 10 seconds.

(c) The field strength of emissions radiated on any frequency outside of the specified band shall not exceed the general radiated emission limits in § 15.209.

(d) In the case of radio frequency powered tags designed to operate with a device authorized under this section, the tag may be approved with the device or be considered as a separate device subject to its own authorization. Powered tags approved with a device under a single application shall be labeled with the same identification number as the device.

(e) To prevent interference to Federal Government radar systems, operation under the provisions of this section is not permitted within 40 kilometers of the following locations:

DoD Radar Site	Latitude	Longitude
Beale Air Force Base	39° 08' 10" N	121° 21' 04" W
Cape Cod Air Force Station	41° 45' 07" N	070° 32' 17" W
Clear Air Force Station	64° 55' 16" N	143° 05' 02" W
Cavalier Air Force Station	48° 43' 12" N	097° 54' 00" W
Eglin Air Force Base	30° 43' 12" N	086° 12' 36" W

(f) As a condition of the grant, the grantee of an equipment authorization for a device operating under the provisions of this section shall provide information to the user concerning compliance with the operational restrictions in paragraphs (a) and (e) of this section. As a further condition, the grantee shall provide information on the locations where the devices are installed to the FCC Office of Engineering and Technology, which shall provide this information to the Federal Government through the National Telecommunications and Information Administration. The user of the device shall be responsible for submitting updated information in the event the operating location or other information changes after the initial registration. The grantee shall notify the user of this requirement. The information provided by the grantee or user to the Commission shall include the name, address, telephone number and e-mail address of the user, the address and geographic coordinates of the operating location, and the FCC identification number of the device. The material shall be submitted to the following address:

Experimental Licensing Branch, OET
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

ATTN: RFID Registration

APPENDIX B: LIST OF COMMENTING PARTIES

Parties filing comments

1 ADEMCO Group
2. AdvaMed
3. Al Brittain
4. Albert Deshotel
5. Armadillo Intertie, Inc.
6. ARRL, The National Association for Amateur Radio
7. Bernard K. Skoch
8. Brian D. Allen
9. Brian James Jarchow
10. Britain Rothrock
11. Bruce Perens
12 Bryan King
13. Central States VHF Society
14. Chamberlain Group, Inc.
15. Charles Byers
16. Charles P. Adkins
17. Chester Piotrowski
18. Christian O. Hunt
19. Christopher Howard
20. Christopher J. Osburn
21. Cisco Systems, Inc.
22. Cobra Electronics Corporation
23 Comsearch
24. Consumer Electronics Association
25. Cubic Corporation
26. Dale Drake
27. Daniel Kane
28. DataBrokers, Inc.
29. David A. Merriweather
30. David Batzle
31. David C. Counce
32. David Clark
33. David Donnelly
34. David HM Spector
35. David Wilkinson
36. Deerik W. Shryock
37. Dennis Swanson
38. Derwood Eadie
39. Donald C. Karon
40. Doran S. Platt III
41. Dr. Andrew E. Mossberg
42. Dwight B. Hill
43. Enalasys Corporation
44. Eric M. Funderburk
45. Eric Schmidt
46. Escort, Inc. and BEL, Inc.
47. Flash Parlini
48. Fred C. Jensen
49. Frederick C. Gantzer
50. Frederick Patton
51. Galen K. Watts
52. Gap, Inc.
53. Gary Rotter
54. George Washburn
55. Harold Tate
56. HID Corporation
57. Howard Malone
58. Hughes Network Systems, Inc.
59. IBM Corporation
60. Information Technology Industry Council
61. Interlogix, Inc.
62. Jack Daane
63. James A. Talbot, Jr.
64. James E. Reynolds
65. James Edwin Whedbee
66. James Hayes
67. Jeff Ballif
68. Jeff Stidham
69. Jeffrey D. Taylor
70. Jeffrey P. LaCosse
71. Jeffrey Peter Kershaw
72. John Douglas Lamb
73. John L. D'Ausilio
74. John Paul Dooley
75. John Robert Foulks
76. Johnson Controls, Inc.
77. Jose Cadrecha
78. Joseph A. Elcavage
79. Joseph A. Naujokas
80. Joseph H. Underwood
81. Joseph R. Semer
82. Joseph S. Keer
83. Kenneth P. Eckel, Jr.
84. Kevin Gibson
85. Kyle A. Yoksh
86. Lifeline Systems, Inc.
87. Linear Corporation
88. Loral Skynet
89. MagTek, Inc.
90. Mark S. Seidler
91. Martin Shinko
92. Mattel, Inc.

93. Matthew Becker
94. Melvyn L. Bernstein
95. Michael Brooks
96. Michael J. Linden
97. Michael M. Bradle
98. Michael Swiderski
99. Mike Baugh
100. Mike Moreken
101. Miller Edge, Inc.
102. MOBA Systeme
103. Morris Jones
104. Motorola, Inc.
105. National Aeronautics and Space Administration
. Nicholas S. Frost
107. Nickolaus E. Leggett
108. Operator Specialty Company, Inc.
109. PanAmSat Corporation
. Paul J. Tringas
111. Pete Myers
112. Philips Semiconductors
113. Polhemus, Inc.
114. Power Line Communications Association
115. RADAR Members
116. Ray Todd Stevens
117. Richard Adamo
118. Richard Lourette
119. Rick Eastwood
120. Roadrunners Microwave Group
121. Robert Brown
122. Robert S. Bennett
123. Robert Winkworth
124. Safety Warning System, L.C.
125. Sanjay Kapur
126. Satellite Industry Association
127. Savi Technology, Inc.
128. SES Americom, Inc.
129. Short Range Automotive Radar Frequency Allocation Group
130. Shure Incorporated
131. Sirius Satellite Radio, Inc.
132. Spacenet, Inc. and StarBand Communications, Inc.
133. Steven Bryant
134. Telecommunications Industry Association
135. Texas Instruments
136. Texas VHF-FM Society, Inc.
137. The Genie Company
138. The Whistler Group, Inc.
139. Tighe W. Kuykendall
140. Tom Masterson
141. TRP, Inc.
142. Uniden America Corporation
143. United Telecom Council
144. Verlin E. Reiter
145. Vincent F. DiMalta
146. VYTEK Solutions, Inc.
147. Wacom Technology Corp.
148. Warren Bruene
149. Warren J. Dickie
150. William A. Tynan
151. William F. Osler
152. William Owens
153. XM Radio, Inc.

Parties filing reply comments

1. Ademco Group
2. Amateur Television Network
3. American Council of Independent Laboratories
4. ARRL, The National Association of Amateur Radio
5. Arthur T. Farrand
6. Brent D. Oots
7. Brice D. Hornblack
8. Calvin Keli Lunny
9. Charles E. Quentel, III
10. Christopher Nelson
11. Current Technologies
12. Curtis V. Rocke
13. Daniel J. Serafini
14. Duane Whittingham
15. Edwin S. Toal
16. Escort Incorporated and BEL Incorporated
17. Gerald W. Murray
18. Glenn Pederson
19. Harold C. Arnold
20. Hughes Network Systems, Inc.
21. Illinois Repeater Association, Inc.
22. Indiana Repeater Council
23. Interlogix, Inc.
24. Intersil Corporation
25. James Anderson
26. John A. Weeks
27. Kevin D. Adam
28. Lloyd W. Fink
29. Martin H. Leider
30. Martin Wilcoxson
31. Matthew Hamm
32. Matthew T. Weeks
33. Michael J. Borowiec
34. Moody Law
35. Motorola, Inc.
36. Patrick T. Weeks
37. RADAR Members
38. Ray Todd Stevens
39. Retlif Testing Laboratories
40. Richard Kelly
41. Satellite Industry Association
42. Savi Technology, Inc.
43. SES Americom, Inc.
44. Seymour Hersh
45. Short Range Automotive Radar Frequency Allocation Group
46. Sirius Satellite Radio, Inc.
47. Sky A. Borgenhagen
48. Stanley Vandiver
49. Steven Handler
50. Texas Instruments
51. The Chamberlain Group, Inc.
52. Timothy Thomas Lanners
53. TRP, Inc.
54. Upper New York Repeater Council, Inc.
55. Ward Wheaton
56. Western Washington Amateur Relay Association
57. William Richards
58. XM Radio, Inc.

APPENDIX C: FINAL REGULATORY FLEXIBILITY ANALYSIS

As required by the Regulatory Flexibility Act (RFA),[59] an Initial Regulatory Flexibility Analysis (IRFA) was incorporated in the *Notice of Proposed Rule Making and Order, Review of Part 15 and other Parts of the Commission's Rules* (*Notice*).[60] The Commission sought written public comments on the proposals in the Notice, including comment on the IRFA.[61] This Final Regulatory Flexibility Analysis conforms to the RFA.[62]

A. Need for, and Objectives of, the Third Report and Order

Section 11 of the Communications Act of 1934, as amended, and Section 202(h) of the Telecommunications Act of 1996 require the Commission (1) to review biennially its regulations pertaining to telecommunications service providers and broadcast ownership; and (2) to determine whether economic competition has made those regulations no longer necessary in the public interest. The Commission is directed to modify or repeal any such regulations that it finds are no longer in the public interest.

As part of the biennial review for the year 2000, the Commission reviewed its regulations pertaining to telecommunications service providers and broadcast ownership and recommended a number of changes to those rules. While not specifically required by statute, the Commission also reviewed Parts 2, 15 and 18 as part of this process.

The Third Report and Order increases the maximum permitted field strength and transmission duration for radio frequency identification (RFID) systems operating in the 433.5-434.5 MHz band to allow more rapid and reliable data transmission. Operation of such systems is limited to commercial shipping containers in commercial and industrial areas. Improved RFID systems could benefit commercial shippers and have significant homeland security benefits by enabling the entire contents of shipping containers to be easily and immediately identified, and by allowing a determination of whether tampering with the contents has occurred during shipping.

B. Summary of Significant Issues Raised by Public Comments in Response to the IRFA

None.

C. Description and Estimate of the Number of Small Entities To Which the Proposed Rules Will Apply

The RFA directs agencies to provide a description of and, where feasible, an estimate of the number of small entities that may be affected by the rules adopted herein.[63] The RFA generally defines

[59] *See* 5 U.S.C. § 603. The RFA, *see* 5 U.S.C. § 601 – 612, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L No. 104-121, Title II, 110 Stat. 857 (1996)

[60] *See Notice of Proposed Rule Making and Order* in ET Docket No. 01-278, 16 FCC Rcd 18205 (2001).

[61] *Id.*

[62] *See* 5 U.S.C. § 604

[63] 5 U.S.C. § 604.

the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."[64] In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.[65] A small business concern is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the SBA.[66]

The SBA has developed small business size standards for two pertinent Economic Census categories, "Radio and Television Broadcasting and Communications Equipment" (RTB) and "Other Communications Equipment," both of which consist of all such companies having 750 or fewer employees.[67] According to Census Bureau data for 1997, there were a total of 1,215 establishments in the first category, total, that had operated for the entire year.[68] Of this total, 1,150 had 499 or fewer employees, and an additional 37 establishments had 500 to 999 employees.[69] Consequently, we estimate that the majority of businesses in the first category are small businesses that may be affected by the rules and policies adopted herein. Concerning the second category, the data for 1997 show that there were a total of 499 establishments that operated for the entire year.[70] Of this total, 491 had 499 or fewer employees, and additional 3 establishments had 500 to 999 employees.[71] Consequently, we estimate that the majority of businesses in the second category are small businesses that may be affected by the rules and policies adopted herein.

D. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements

Manufacturers of 433 MHz RFID systems will have to obtain certification for the equipment before it can be marketed. This requires the manufacturer to have the equipment tested for compliance, file an application with the Commission or a designated Telecommunication Certification Body (TCB) and wait

[64] 5 U.S.C. § 601(6).

[65] 5 U.S.C. § 601(3) (incorporating by reference the definition of "small business concern" in 15 U.S.C. § 632). Pursuant to the RFA, the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register." 5 U.S.C. § 601(3).

[66] Small Business Act, 15 U.S.C. § 632 (1996).

[67] 13 C.F.R. § 121.201, NAICS codes 334220, 334290.

[68] U S. Census Bureau, 1997 Economic Census, Industry Series: Manufacturing, Radio and Television and Wireless Communications Equipment Manufacturing, "Industry Statistics by Employment Size: 1997," Table 4, NAICS code 334220 (issued Aug. 1999). The number of "establishments" is a less helpful indicator of small business prevalence in this context than would be the number of "firms" or "companies," because the latter take into account the concept of common ownership or control. Any single physical business location is an establishment, and that location and others may be under the common ownership of a given firm. Thus, the numbers given in text may reflect inflated numbers of businesses in this category, including the numbers of small businesses. Census data in this context are available only for establishments.

[69] *Id*

[70] U S. Census Bureau, 1997 Economic Census, Industry Series: Manufacturing, Other Communications Equipment Manufacturing, "Industry Statistics by Employment Size: 1997," Table 4, NAICS code 334290 (issued Sept. 1999).

[71] *Id*

for an approval before the equipment may be imported into or marketed within the United States. There will be no change to the certification procedure from what the rules currently require. There will be a new requirement for the grantee of certification to supply information to the Commission on where the devices are used. The information that must be submitted includes the name, address and other pertinent contact information of the user, the address and geographic coordinates of the operating location, and the FCC identification number of the device. In addition, the user of the device will have to notify the Commission of any changes to this information after the initial registration by the grantee.

E. Steps Taken to Minimize Significant Economic Impact on Small Entities, and Significant Alternatives Considered

The RFA requires an agency to describe any significant alternatives that it has considered in reaching its proposed approach, which may include the following four alternatives (among others): (1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.[72]

The rules specify performance standards for RFID equipment such as emission levels, as opposed to design standards. Because the rules are intended to minimize the potential for interference to authorized services in the 433 MHz band, and it is not possible to exempt small entities from complying with any requirements without increasing the risk of harmful interference. We note that a number of entities expressed concern about the possibility of interference from 433 MHz RFID systems to door opener controls As discussed in paragraph 23 of the Third Report and Order, we have made a number of changes from our proposals that will eliminate any significant risk of interference to door opener controls.

Report to Congress: The Commission will send a copy of the Third Report and Order, including this FRFA, in a report to be sent to Congress pursuant to the Congressional Review Act, *see* 5 U.S.C. § 801(a)(1)(A). In addition, the Commission will send a copy of the Third Report and Order, including FRFA, to the Chief Counsel for Advocacy of the Small Business Administration. A copy of the Third Report and Order and FRFA (or summaries thereof) will also be published in the Federal Register. *See* 5 U.S.C. § 604(b).

[72] *See* 5 U S.C. § 603(c).

STATEMENT OF
CHAIRMAN MICHAEL K. POWELL

Re: Review of Part 15 and other Parts of the Commission's Rules, Third Report and Order, ET Docket No. 01-278

With more than two billion tons of freight traveling through U.S. ports and waterways yearly, ensuring the efficient flow of goods while reducing the possibility of terrorism and fraud is no easy task.

Today's *Third Report and Order* allows a powerful new technology to help secure our ports while increasing productivity. Specifically, we change Commission rules to allow for the introduction of smart shipping containers that can detect intrusions and streamline the inventory process.

When you consider that a trillion dollars worth of goods pass through our ports annually, the potential economic benefits of this technology become clear.

It is worth noting that some have raised privacy concerns regarding the use of radio frequency identification (RFID) tags. We are aware of these concerns, and stress that today's ruling is narrowly tailored. The technical and operational rules we adopt today allow higher-powered/longer-duration RFID tag use on limited frequencies, and only in commercial and industrial environments. We also take steps to protect federal government radar sites from interference by requiring grantees of an equipment authorization for a 433 MHz RFID device to register their location and inform purchasers where the devices may or may not be used.

I'm excited by the prospects for improved inventory control, lower costs, and increased homeland security that this technology promises to bring.